

APPENDIX 3 TO ANNEX E

C22 MODULAR PISTOL PROJECT

TECHNICAL EVALUATION PROCEDURES

FOR PHASES 2 AND 3



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NOTICE

This documentation has been reviewed by the technical authority and does not contain controlled goods. Disclosure notices and handling instructions originally received with the document shall continue to apply.

1. **PURPOSE**

- 1.1. The purpose of this document is to detail the testing procedures that must be followed during Phases 2 and 3 of the bid evaluation, to verify compliance of the Bid Samples to selected Requirements from Annex C.

2. **PRELIMINARY NOTES**

- 2.1. Serial # must be recorded for all Bid Samples at the start of Phase 2 evaluation.
- 2.2. Round count must be tracked for all Bid Samples throughout testing during Phase 2 and Phase 3.
- 2.3. Primed casings, blanks or dummy cartridges may be used in situations where the test facility deems it unsafe to use live cartridges.
- 2.4. The Bid Samples must be uniquely labeled for identification purposes as follows:
- 2.4.1. FF A to H.

3. **PHASE 2 PART II – LABORATORY AND RANGE TESTING**

3.1. **Test 1: Ammunition Compatibility/Safety Inspection**

3.1.1. Aim

- a. Canada must complete a complete safety inspection of all Bid Samples to confirm compliance to requirements 3.1.1 to 3.1.3 of Annex C, and verify that the Bid Samples fire safely.

3.1.2. Procedure

- a. All Bid Samples must be inspected and gauged to verify that they are safe to fire using maintenance gauges provided with the Bid Samples.
- b. Following the safety inspection, a CAF shooter must fire 5 rounds of Canadian Mk 1 Ball 9 x 19 mm ammunition with each Bid Sample to confirm safe operation.
- c. If any Bid Sample is found to be unsafe to fire, the Bidder must be notified, and must resolve all issues within 72 hours at no cost to Canada.

3.1.3. Sentencing Criteria

- a. For any Bid Sample that is deemed unsafe to fire, and the bidder is not able to correct the deficiencies within the allotted time, the reasons must be recorded and the bid must be deemed non-compliant and given no further consideration.

3.2. **Test 2: Safety Mechanism Operation**

3.2.1. Aim

- a. Verify compliance to requirements 3.7.13, 3.9.1 and 3.9.2 of Annex C.

3.2.2. Procedure

- a. All Bid Samples must be used to confirm compliance.
- b. Insert a fully loaded magazine into the Bid Sample.
- c. Load a cartridge into the chamber by racking the slide.
- d. Fire 2 cartridge of Canadian Mk 1 Ball 9 x 19 mm ammunition from the weapon then cease-fire.
- e. Remove the loaded magazine from the Bid Sample.
- f. Remove the live cartridge from the chamber by racking the slide rearward and return the slide to the forward position.
- g. Fully disassemble the Bid Sample following manufacturer's procedures for cleaning without pulling the trigger to fire the Bid Sample.

3.2.3. Sentencing Criteria

- a. Confirm that the shooter can both see and feel the loaded chamber indicator on the top of the slide when the Bid Sample is first loaded and following each shot.
- b. Confirm that the Bid Sample can be fully disassembled without having to pull the trigger to fire the Bid Sample.

3.3. **Test 3: Precision And Accuracy Testing**

3.3.1. Aim

- a. Verify compliance to requirement 3.16.1 of Annex C.

3.3.2. Setup

- a. All Bid Samples must be used to confirm precision and accuracy requirements.
- b. All precision and accuracy shooting must be conducted on an indoor 25 m range.
- c. All precision and accuracy shooting must be from a ransom rest where the Bid Sample has been secured using grip inserts for the medium grip size provided by the bidder.
- d. Aiming of each shot must be conducted using laser aiming device(s) attached to the ransom rest to ensure consistent and repeatable point of aim.
- e. Paper or electronic targets or both must be used to allow evaluators to measure precision.

3.3.3. Procedure

- a. Fire 10 cartridges (Canadian Mk 1 Ball 9 x 19 mm ammunition) to confirm that the Bid Sample is properly secured in the ransom rest, that all ransom rest hardware remains tight and the laser aiming devices are functional and allow the shooter to maintain a consistent point of aim.
- b. Conduct a precision test by firing 5 x 5 cartridge groupings using Canadian Mk 1 Ball 9 x 19 mm ammunition;
 - i. The tester may reshoot up to 1 of the 5 groupings, if there was an anomaly (flyer) in the groupings compared to the other groupings by that weapon.

3.3.4. Results

- a. Canada must calculate the precision and the MPI for each group, and record all measurements on the record sheet at Attachment 1 to Appendix 3 to Annex E. Targets used for precision shooting must be labeled and retained for record purposes.

3.3.5. Sentencing Criteria

- a. The Maximum Extreme Spread for each of the 5 round groupings must be less than or equal to 12 cm.
- b. All the rows in the table of Attachment 1 of Appendix 3 must be Compliant, where applicable.

3.4. **Test 4: Trigger Pull Force**

3.4.1. Aim

- a. Verify compliance to requirements 3.7.6, 3.7.7 and 3.7.9 of Annex C.

3.4.2. Procedure

- a. All Bid Samples must be used to confirm that the trigger pull force are within specification.
- b. The Bid Sample must be secured in a fixture to ensure accurate and repeatable results.
- c. Using a digital trigger pull force gauge measure the trigger pull force at the point the weapon fires. Repeat the test 10 times for each Bid Samples letting the trigger fully reset between each trigger pull.

3.4.3. Sentencing Criteria

- a. The trigger pull measurement for each trigger pull must meet the range specified in Requirement 3.7.6 of Annex C.
- b. The trigger pull weight for each Bid Sample must be consistent with a maximum deviation of +/- 0.2 kgs across the 10 trigger pull measurements.

- c. The trigger must reset to its normal forward most position upon release after partial or complete trigger pull

3.5. **Test 5: Low Temperature Operation**

3.5.1. Aim

- a. Verify compliance to requirement 3.20.2 of Annex C.

3.5.2. Procedure

- a. Perform this test on FF A and FF B.
- b. Condition Magazines, cartridges, and Bid Samples to the temperature specified in Requirement 3.20.2 of Annex C, +/- 3°C, for 12-24 hours, using Manufacturer's recommended preparation procedure for low temperature operation.
- c. Test the Bid Sample in accordance with AECTP 300, Method 303, Low Temperature, Procedure IIa, Operation Test (Constant Temperature) and Procedure III, Manipulation Test.
- d. Load 2 magazines for each Bid Sample with 10 cartridges conditioned at 3.5.2.b.
- e. Operate switches and adjustments.
- f. Load the Bid Sample with the first magazine and fire 10 cartridges of Canadian Mk 1 Ball 9 x 19 mm ammunition.
- g. Remove the first magazine and load the Bid Sample with the second magazine and fire 10 cartridges of Canadian Mk 1 Ball 9 x 19 mm ammunition.

3.5.3. Sentencing Criteria

- a. The Bid Sample must remain serviceable, safe to operate, and complete the test with no more than one Class 1 Stoppage as described in Annex C.

3.6. **Test 6: High Temperature Operation**

3.6.1. Aim

- a. Verify compliance to requirement 3.20.3 of Annex C.

3.6.2. Procedure

- a. Perform this test on FF C and FF D.
- b. Condition Magazines, cartridges, and Bid Samples to the temperature specified in Requirement 3.20.3 of Annex C, +/- 3°C, for 12-24 hours, using Manufacturer's recommended preparation procedure for high temperature operation.
- c. Test the Bid Sample in accordance with AECTP 300, Method 302, Procedure II High Temperature Operation (Constant Temperature).

- d. Load 2 magazines for each Bid Sample with 10 cartridges conditioned at 3.6.2.b.
- e. Operate switches and adjustments.
- f. Load the Bid Sample with the first magazine and fire 10 cartridges of Canadian Mk 1 Ball 9 x 19 mm ammunition.
- g. Remove the first magazine and load the Bid Sample with the second magazine and fire 10 cartridges of Canadian Mk 1 Ball 9 x 19 mm ammunition.

3.6.3. Sentencing Criteria

- a. The Bid Sample must remain serviceable, safe to operate, and complete the test with no more than one Class 1 Stoppage as described in Annex C.

3.7. **Test 7: Interchangeability Test**

3.7.1. Aim

- a. Verify compliance to requirement 3.19.1 of Annex C for (1) New Weapon only.

3.7.2. Procedure

- a. Perform this test using all Bid Samples.
- b. The Bid Samples must be disassembled into the major subassembly Groups as indicated below:

Subassembly Groups:

Group 1: Magazine;

Group 2: Trigger Group/Fire Control Assembly;

Group 3: Barrel;

Group 4: Slide;

Group 5: Recoil Assembly (incl Guide and Spring);

Group 6: Grip Frame/Module;

Group 7: Striker Assembly; and

Group 8: Magazine Catch (incl Spring, catch and stop) Assembly and Takedown Lever.

- c. The Bid Samples must be reassembled according to the weapon interchangeability chart at Table 1:

Component/Assembly	Interchanged Weapon Letter							
	A	B	C	D	E	F	G	H
Group 1	1	8	7	6	5	4	3	2
Group 2	2	1	8	7	6	5	4	3
Group 3	3	2	1	8	7	6	5	4
Group 4	4	3	2	1	8	7	6	5
Group 5	5	4	3	2	1	8	7	6
Group 6	6	5	4	3	2	1	8	7
Group 7	7	6	5	4	3	2	1	8
Group 8	8	7	6	5	4	3	2	1

Table 1: Interchangeability Chart

- d. Load a full magazine and fire 5 x cartridges (Canadian Mk 1 Ball 9 x 19 mm ammunition) from each interchanged Bid Sample to confirm operation.
- e. The Interchanged Bid Samples must be returned to the original state (ie FF A to FF H).

3.7.3. Sentencing Criteria

- a. All major subassembly groups must be found to be interchangeable between the Bid Samples.
- b. The interchanged Bid Samples must be serviceable and fire safely.

3.8. **Test 8: Suppressor Precision**

3.8.1. Aim

- a. Verify compliance to requirement 3.17.5 Suppressor of Annex C.

3.8.2. Setup

- a. Follow the set-up procedures in Test 3

3.8.3. Procedure

- a. Perform this test on FF A.
- b. Replace the barrel of FF A with the threaded barrel that is fit to receive the suppressor.
- c. Install the suppressor on FF A.
- d. Fire 10 cartridges of Canadian Mk 1 Ball 9 x 19 mm ammunition to confirm that the Bid Sample is properly secured in the ransom rest that all ransom rest hardware remains tight and the laser aiming devices are functional and allow the shooter to maintain a consistent point of aim.
- e. Conduct a precision test by firing 5 x 5 cartridge groupings using Canadian Mk 1 Ball 9 x 19 mm ammunition;

- i. The tester may reshoot up to 1 of the 5 groupings, if there was an anomaly (flyer) in the groupings compared to the other groupings by that weapon.
- f. Remove the suppressor and threaded barrel and return FF A to its original configuration.

3.8.4. Results

- a. Canada must calculate the precision and the MPI for each group, and record all measurements on the record sheet at Attachment 1 to Appendix 3 to Annex E.

3.8.5. Sentencing Criteria

- a. The Maximum Extreme Spread for each of the 5 round groupings must be less than or equal to 12 cm.
- b. All the rows in the table of Attachment 1 of Appendix 3 must be Compliant, where applicable.

3.9. **Test 9: 1.5 Meter Safety Drop**

3.9.1. Aim

- a. Verify compliance to all requirements detailed in section 3.21 1.5 Meter Safety Drop.

3.9.2. Setup

- a. Perform this test on FF A.
- b. Each drop test must be performed with a fully loaded magazine.

3.9.3. Procedure

- a. Test the Bid Sample in accordance with TOP 3-2-045A, Method 4.8.2, 1.5 Meter (5 Feet) Drop.
- b. Prior to each drop insert a fully loaded magazine with primed cartridges into the Bid Sample and cycle the action to load the Bid Sample with the primed cartridge.
- c. The Bid Sample must be suspended 1.5 m above the impact surface, with the following orientations of the Bid Sample:
 - i. Muzzle Down: Muzzle must be the closest part of the pistol to the concrete floor;
 - ii. Muzzle Up: Muzzle must be the farthest part of the pistol to the concrete floor;
 - iii. Slide Up (Horizontal); Top of the side must be the farthest part of the pistol to the concrete floor;
 - iv. Slide Down (Horizontal): Top of the side must be the closest part of the pistol to the concrete floor;

- v. Right Side (Horizontal): Right side of the pistol must be oriented as the closest part of the pistol to the concrete floor; and
- vi. Left Side (Horizontal): Left side of the pistol must be oriented as the closest part of the pistol to the concrete
- d. The Bid Sample must be dropped from orientation i. using a quick release mechanism onto the specified impact surface.
- e. The loaded primed cartridge is to be removed post drop for inspection.
- f. The Bid Sample is to be loaded with a primed cartridge which is to be fired to confirm that the Bid Sample remains functional.
- g. The Bid Sample must be reloaded IAW 3.9.3.b and the remaining drop orientation in step c are to be completed in order following steps d to e.
- h. The Bid Sample can be caught after the drop to avoid secondary damage.

3.9.4. Sentencing Criteria

- a. Inspect each primed cartridge following each drop to confirm that it was not discharged and that there are no visible indication of impact to the primer.
- b. The Bid Sample must remain serviceable, safe to operate, and fire a primed cartridge following each drop orientation.

4. **PHASE 3 – ENDURANCE AND PRECISION TESTING**

4.1. **Test 10: Endurance and Precision Test**

4.1.1. Aim

- a. Verify compliance to all requirements detailed in section 3.15 Performance and requirement 3.16.1 of Annex C.

4.1.2. Setup

- a. Perform this test on FF E.
- b. All precision and accuracy shooting must be conducted on a 25 m range.
- c. All precision shooting must be from a ransom rest where the Bid Sample has been secured using grip inserts provided by the bidder.
- d. Aiming of each shot must be conducted using laser aiming device attached to the ransom rest to ensure consistent and repeatable point of aim.
- e. Paper or electronic targets or both must be used to allow evaluators to measure precision.
- f. All endurance shooting must be performed by a shooter or from a ransom rest.
- g. Spare parts and consumables provided with the Bid Samples must be used in support of this test when necessary.
- h. Canada must perform all operator, preventative and corrective maintenance actions on the Bid Sample for the duration of the test, in accordance with OEM Operator and Maintenance Manuals.
- i. The Bid Sample must only be fired when barrel temperature is below the manufacturer's maximum barrel temperature.
- j. The endurance and precision testing must be completed without the replacement of the trigger group assembly, the slide assembly or the barrel.
- k. All weapon-related stoppages must be recorded in the "Comments (Failures)" column in Attachment 2 to Appendix 4 during the endurance and precision tests.

4.1.3. Procedure

- a. Bid Sample must be subjected to an Endurance test of 10,000 rounds as per the sequence detailed in Attachment 2 to Appendix 3 to Annex E.
- b. Total rounds fired during Phase 2 Part II must count towards the first Endurance sequence (Seq # 1a) in Attachment 2 to Appendix 3 to Annex E.

- c. Precision testing must be performed following procedures in Test 3 para 3.3.3.b.

4.1.4. Results

- a. Canada must calculate the precision and the MPI for each group, and record all measurements on the record sheet at Attachment 2 to Appendix 3 to Annex E. Targets used for precision shooting must be labeled and retained for record purposes.

4.1.5. Sentencing Criteria

- a. The Maximum Extreme Spread for each of the 5 round groupings must be less than or equal to 12 cm.
- b. All the rows in the table of Attachment 2 of Appendix 3 must be Compliant, where applicable.
- c. The Bid Sample must not experience more than 4 Class 1 stoppages and no more than 1 Class 2 stoppages as defined in Annex C. Ammunition related stoppages are not attributed to the Bid Sample.